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The Shift of a Dividend Policy and a Leverage Policy during the 2008 Financial Crisis.

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Abstract

This paper investigates how firms shifted their dividend policies and leverage policies in response to the economic shock caused by the 2008 financial crisis. The sample countries are United States, Great Britain, France, Germany, Australia, Japan, China, and Korea. The empirical relationship of firms' dividend policies with their capital structures and earnings was likely to undergo a major change around the 2008 financial crisis, as firms adjusted their capital structures and dividend policies in response to the extreme credit crunch caused by the financial crisis. The extent and the speed that firms deleverage themselves and reduce their dividends were likely to be influenced by countries' cultural and social norms. This paper finds a significant reduction in dividends across sample countries except Great Britain and France after the 2008 crisis. This finding supports the free cash flow theory that dividends are paid to dissipate free cash flow to address agency conflicts between managers and shareholders. This paper finds a higher correlation between dividends and leverages before the 2008 crisis, and that it strengthened after the crisis except Great Britain and Korea. This finding is consistent more with the pecking order theory than with the trade-off theory of leverage.

Key Words: *Dividend; Leverage; Financial Crisis; Cultural Norm*

JEL classification: *G01, G31, G35*

Introduction

This study examines how firms' dividend and leverage policies changed in response to the 2008 financial crisis, and tests the free cash flow theory and the pecking order theory. The unprecedented economic crisis caused by subprime mortgages forcefully changed dividend policies and leverage policies of most firms in financial sectors as well as industrial sectors. The crisis forced many prominent financial firms into bankruptcy. The stock market experienced 77% decline in market value. The housing market went into a prolonged slump. U.S. unemployment rate increased to 12%. U.S. and worldwide economic outputs declined by 25%. European sovereign debt crisis in 2010-2012 was a consequence of the crisis. Deregulations, ensuing subprime mortgage defaults and growth of shadow banking were likely to be main culprits of the crisis. Most firms deleveraged and reduced dividends to survive in response to the

worldwide economic downturn. The crisis provides an excellent window to test how an economic shock affects dividend and leverage policies.

This paper also examines cross country variations of eight countries on dividend and leverage policies, and whether cultural factors have explanatory power to the cross country variations. This paper employs individualism, power distance, and uncertainty avoidance as cultural factors, which were measured by Hofstede (1980).

This study finds a statistically significant decrease of dividend payout ratio after the 2008 financial crisis, which supports the free cash flow theory of dividend. This study finds a positive correlation between firms' leverages and dividends before the 2008 financial crisis, which was strengthened after 2008. This finding can be interpreted as a support for the pecking order theory of leverage. Cross-country variations in dividend payouts and leverages could not be explained by cultural factors.

Research and Methodology

Hypotheses

The first hypothesis states that the relationship between corporate dividends and earnings had weakened after the 2008 financial crisis. Before the 2008 crisis, firms disbursed free cash flow via dividends and/or share repurchases. As a free cash flow is a component of firm's earnings, many previous researches established an empirical relationship between firm's earnings and dividends. As the 2008 crisis reduced firms' earnings significantly and subsequently firms' free cash flow, the empirical relationship between earnings and dividends are expected to be weakened according to the free cash flow theory (Lang and Litzenberger, 1989). If earnings and dividends were reduced by a same or close proportion, the empirical relationship between earnings and dividends would be unchanged even after the 2008 crisis. If a firm's earnings would not be sufficient to invest all positive net present value projects as its free cash flow disappears, then the relation between earnings and dividends would be significantly weakened. Therefore this paper predicts that an empirical relationship between earnings and dividends after the 2008 crisis would be weakened, which would support the free cash flow hypothesis of dividends.

The second hypothesis states that the relationship between corporate dividends and leverages had strengthened after the 2008 financial crisis. Since debts can be analogous to negative dividends because it increases cash balance of debt-issuing firms, this paper includes leverage into the model to incorporate negative dividends as well as cash dividends. The pecking order theory by Myers and Majluf (1984) posits that internal fund is cheaper than debt financing, which is cheaper than equity financing, due to information asymmetry and adverse selection. It, jointly with the free cash flow theory, predicts a positive correlation between a firm's leverage and its dividend, as cash infusion from higher leverage needs to be dissipated to address a potential agency conflict from a higher free cash balance. The traditional trade-off theory posits that a firm determines its optimal leverage by balancing the benefit of tax deductibility of debts against the cost of bankruptcy risk and the agency cost of leverage. The trade-off theory predicts that higher leverages result in lower dividends to reduce the risk of bankruptcy. There is a known endogeneity issue between leverages and dividends. Nonetheless, this paper assumes leverages and dividends are exogenous variables.

Research Design

$$\text{Dividend} = \beta_0 + \beta_1 \text{ Earning} + \beta_2 \text{ Earning*Dummy} + \beta_3 \text{ Leverage} + \beta_4 \text{ Leverage*Dummy} + \beta_5 \text{ Asset} + \varepsilon$$

Dividend is measured by common/ordinary dividends from the COMPUSTAT. *Earning* is defined as income before extraordinary items. *Leverage* is defined at long-term debt divided by total assets. *Asset* is a control variable for a size effect and is defined as total assets. *Dummy* is a binary variable to differentiate the sampling period, and is defined as 0 for the fiscal year 2005 to 2007 (pre-crisis sample), and as 1 for the

fiscal year 2008 to 2010 (post-crisis sample). Sample firms are drawn out from the population of the COMPUSTAT, excluding firm-year samples with any missing value for our research variables.

The regression model is based on the empirical relation between earnings and dividends. As higher earnings would result in higher dividends, if other things are equal, β_1 is expected to be positive. The 2008 financial crisis was likely to shrink firms' earnings as well as its dividends. If magnitudes of reductions of earnings and dividends were same, β_2 would remain unchanged after the crisis. As the free cash flow theory posits that dividends are paid mostly out of free cash flow, disappearance of free cash flow by the crisis is likely to reduce dividends more deeply than earnings. Therefore this paper predicts β_2 to be negative, which is a prediction of the free cash flow theory of dividends.

The trade-off theory predicts that regression coefficients between leverages and dividends, β_3 and β_4 to be negative, as firms are likely to reduce dividends to counterbalance the bankruptcy risk raised by being highly levered firms. The pecking order theory and the free cash flow theory jointly predicts β_3 and β_4 to be positive, as firms are likely to increase dividends to address agency conflicts caused by increased cash balance from being highly levered firms.

Results

Table 1 reports descriptive statistics for cash dividends, earnings, long-term debts and total assets of firm-year observations from eight sample countries. United States has 63,421 firm-year observations from 2005 to 2010. Japan has 20,338 sample-firm year observations. The remaining sample countries have relatively small observations ranging from 1,408 (France) to 3,729 (Great Britain). Sample firms from United States, Great Britain, Germany, and France are larger in terms of all research variables than those from China, Japan, Korea, and Australia. Asian (China, Japan, Korea) sample firms show low payout ratios and low leverage relative to five western countries' firms, which are partially explained by shareholder activism and power distance between managers and shareholders.

Table 2 reports the results from a regression of the model based on U.S. sample firm-years to test the payout hypothesis and the leverage hypothesis. The estimated coefficient for earnings, b_1, is statistically significantly positive, which can be interpreted as an average dividend payout ratio. The estimated coefficient for earnings dummy variable, b_2, is statistically significantly negative, which indicates dividend payouts decreased from the pre 2008 crisis period to the post 2008 crisis period. As firms' earnings decreased significantly from operational and financial hardships caused by credit crunches around the 2008 financial crisis, firms responded by reducing discretionary dividends to shareholders as free cash components of earnings were completely dried up, which is consistent with the free cash flow theory.

Table 1: Mean for Regression Variables for 8 Sample Countries

Variables	USA	GBR	AUS	GER	FRA	JPN	CHN	KOR
# of obs	63,421	3,729	2,489	1,452	1,408	20,338	1,959	3,197
Dividends	81	187	75	159	137	22	74	20
Earnings	178	414	133	362	285	62	201	115
Debts	1,829	1,145	417	2,157	1,508	462	443	408
Assets	10,586	6,053	1,827	11,519	7,790	2,527	3,235	2,847

Table 2: Regression Coefficients from the Model Based on the USA sample

$$\text{Dividend} = \beta_0 + \beta_1 \text{ Earning} + \beta_2 \text{ Earning*Dummy} + \beta_3 \text{ Leverage} + \beta_4 \text{ Leverage*Dummy} + \beta_5 \text{ Asset} + \varepsilon$$

	b_0	b_1	b_2	b_3	b_4	b_5
coefficient	90.476	0.233	-0.046	0.007	0.003	0.000
t stat	23.373	75.487	-12.541	20.982	8.452	8.557

The estimated coefficient for leverage and its dummy, b_3 and b_4, is statistically significantly positive, which support the pecking order theory more than the trade-off theory. However, due to the known endogeneity between dividends and leverages, the interpretation of this finding should be careful. As b_4 is estimated to be positive, it is interpreted that deleveraging by firms during the 2008 crisis was more severe than reduction of dividends.

Table 3 reports the result of the regression model for eight sample countries. As for dividend payout response coefficients to earnings, b_1, are all significantly positive as expected. As for changes of dividend payout response coefficients to earnings after the crisis, b_2, are negative, except Great Britain and France. These results can be interpreted to be supportive for the free cash flow theory and this paper's first hypothesis that reductions of dividends were more severe than decreases of earnings. Since Great Britain's subprime mortgage crisis followed the similar course as the U.S.A. did, it is unexpected to find positive b_2, given that both countries are under the similar common law based, competitive economy.

As for coefficients for dividends and leverages, b_3 and b_4, are turned out be positive for most countries, supporting this paper's second hypothesis that deleveraging after the crisis was steeper and faster that reduction of dividend, which is the joint prediction of the pecking order theory and the free cash flow theory. Two countries out of eight sample countries had shown opposite signs, which was likely caused by country's unique factors, be it economic or cultural. Overall results support the free cash flow theory of dividends and the pecking order theory of leverage.

Table 3: Coefficients of the Regression Model for 8 Sample Countries

	USA	GBR	AUS	GER	FRA	JPN	CHN	KOR
b1	0.233	0.100	0.202	0.223	0.317	0.132	0.442	0.136
b2	-0.046	0.050	-0.042	-0.107	0.116	-0.056	-0.038	-0.046
b3	0.007	0.020	0.043	0.013	0.009	-0.011	-0.084	0.011
b4	0.003	-0.030	0.056	0.016	0.017	0.011	0.055	-0.005
All coefficients are statistically significant at 5% level.								

Table 4: Cultural Index by Hofstede (1980)

	Individualism	Power Distance	Uncertainty Avoidance
USA	91	40	46
GBR	89	35	35
AUS	90	36	51
GER	67	35	65
FRA	71	68	86
JPN	46	54	92
CHN	20	80	30
KOR	18	60	85

To explain the cross country variations of the regression results, this paper borrowed three cultural measures by Hofstede (1980), which are presented in Table 4. *Individualism* is found to be positively related with dividends (Fidrmuc et al., 2010). *Power distance* and *uncertainty avoidance* are found to be negatively related with dividends (Fidrmuc et al., 2010). This paper ran OLS regressions of *individualism*, *power distance*, and *uncertainty avoidance* respectively on b_1, b_2, b_3, and b_4, and found insignificant results due to small sample size and derivative natures of b_1, b_2, b_3, and b_4. As France's socialistic economy was somewhat different from common law based Anglo-Saxon competitive economy, French firms' commitment to maintain their dividends might be the reason that France's b_2 turns out to be positive.

Conclusions

This paper finds a significant decrease of dividend payout ratios after the 2008 financial crisis across sample countries except Great Britain and France. This finding supports the free cash flow theory of dividends. Cultural factors like individualism, power distance, uncertainty avoidance fail to explain the exceptions of Great Britain and France. This paper finds a positive relation between leverages and dividends, which supports the pecking order theory more than the tradeoff theory of leverage. It has strengthened after the 2008 financial crisis except Great Britain and Korea samples. This findings are consistent with the pecking order theory and the free cash flow theory. However cultural factors fail to explain cross-country variations.

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